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# Impact of the Texas-Wide Premedical Mentoring Program during the COVID-19 pandemic

Nicole L. Alexander, BSA*[a], Jessica C. Sheu, BA*[a], Alexandra M. Villagran, BS[b], Christi J. Guerrini, JD, MPH[c], and Eric A. Storch, PhD[d]

[a]Baylor College of Medicine, Houston, Texas; [b]University of Utah, Salt Lake City, Utah; [c]Center for Medical Ethics and Health Policy, Baylor College of Medicine, Houston, Texas; [d]Department of Psychiatry and Behavioral Sciences, Baylor College of Medicine, Houston, Texas

**ABSTRACT**

The COVID-19 pandemic disrupted the usual processes and support systems related to applying to medical school in the United States. The Texas-Wide Premedical Mentoring Program (TPMP) was established to pair medical student mentors in Texas with medical school applicants attending Texas colleges and universities. Our objective was to demonstrate the effect of the TPMP on application preparedness and self-reported mental health outcomes of program participants. A survey was developed to understand the program's impact on both mentees and mentors. Participants were sent a survey link 3 months after the TPMP launch. In total, 313 participants, comprising 62% premedical student mentees and 38% medical student mentors, completed the survey. Mentees reported a significantly positive effect of the program on anxiety, uncertainty of acceptance, connection to medicine, and making the road to medical school seem less impossible. After participation, mentees felt less alone and reported a positive impact on their perception of the application process. The TPMP positively impacted the mental wellness of both mentees and mentors, and about 80% of mentors felt more fulfilled despite not participating in clinical duties in light of suspensions. In conclusion, program participation was associated with decreasing application knowledge gaps, easing anxiety, and providing alliance for mentees. The TPMP had a similarly positive influence on the mental wellness of mentees and mentors as well as contributed to medical student mentors' sense of fulfillment.

**KEYWORDS** Applications; coronavirus; mental health; mentorship; students

The COVID-19 pandemic disrupted the usual process for applying to medical school. Undergraduate premedical students would typically be meeting with advisors regarding upcoming applications during the spring semester.[1] The pandemic strained available academic resources for premedical students, caused uncertainty related to the application process, and negatively impacted mental health.[2–4] During the COVID-19 pandemic, there has only been one published report of mentorship involving medical students. In that case, mentorship was provided by upperclassmen medical students, who guided underclassmen in strengthening their social support networks and lessening stress.[5] To assist medical school applicants during the pandemic, the Texas-Wide Premedical Mentoring Program (TPMP) was created, pairing current medical students, faced with suspension of clinical clerkships during the pandemic,[6] with premedical applicants to serve as their mentors and in this way make a positive contribution to medicine.[7–11] Students from 10 Texas medical schools volunteered to mentor premedical students from 14 Texas universities. At the end of March 2020, almost 600 medical students and over 900 premedical students signed on as mentors and mentees, respectively. It was hypothesized that the TPMP would reduce uncertainties caused by the disruptions and enhance application readiness. We also predicted that the TPMP would be associated with positive mental health

**Corresponding author:** Eric A. Storch, PhD, Department of Psychiatry and Behavioral Sciences, Baylor College of Medicine, 1977 Butler Blvd., Suite 4-400, Houston, TX 77030 (e-mail: eric.storch@bcm.edu)

*Contributed equally to this work.

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impacts on both premedical student mentees and medical student mentors. The data reported in this study have potential relevance to a wide range of health programs and could inform the development of similar initiatives in the face of future disasters or sustained disruption from COVID-19.

## METHODS

The TPMP was developed in March 2020 by a student (JCS) at Baylor College of Medicine (BCM) to support premedical students in their medical school applications by pairing them with medical student mentors. Ten Texas allopathic medical schools were included in the program, but the method of recruitment was not standardized. Premedical mentees were recruited from 14 Texas universities that were the alma maters of or otherwise suggested by mentors. The method of recruitment of mentees also was not standardized because of variability in prehealth program support across universities. First, student prehealth organizations were emailed with information about the TPMP using contact email information identified from the universities' websites. If email addresses could not be found online, emails were sent to prehealth advisors. Organizations and advisors interested in participating sent a notice to their respective members and premedical students, collected contact information for interested students, and emailed this information to the TPMP coordinators.

Participants were matched from April 1 to May 21, 2020. In total, the TPMP matched 1483 individuals: 595 mentors to 888 mentees. Some mentees were matched with more than one medical student mentor if one did not fulfill all categories of interest. For example, if a mentee indicated interest in mock interviewing and general application advice, then the mentee was matched with a mentor who indicated an interest in providing help in both categories. If specific requests were made outside of the three areas, efforts were made but not guaranteed to fulfill those requests to increase commonalities. In the standardized welcome email, the pair was encouraged to set up a time to meet. The frequency and content of each pair's communications were then determined by them and depended on, among other things, the mentee's stated needs and the mentor's availability; there were no requirements.

Analyzing the TPMP impact after its creation was then initiated by another BCM student (NLA). On June 15, 2020, a Qualtrics survey link was sent to all program participants by a standardized blind carbon copy email to the email addresses with which they enrolled. Reminder emails were sent on June 30, 2020, and July 14, 2020. The survey closed on July 15, 2020. All survey materials were approved (and not deemed exempt) by BCM Institutional Review Board (H47755).

The survey included five sections following the first page, which introduced the study and explained that participation was voluntary, responses would remain confidential, and students could end their participation at any time. The first section collected demographic and education information. The second section included items directed toward basic mental health history, diagnoses, and treatment experience. The third section included a validated scale to assess participants' psychological distress: the Kessler Psychological Distress Scale (K10).[12] The K10 is a 10-item scale that measures a participant's well-being over the preceding 4 weeks, combining anxiety and depression symptoms to evaluate psychological distress. Participants rate frequency of symptoms on a 5-point Likert scale ranging from 1 (none of the time) to 5 (all of the time). In prior studies, K10 demonstrated strong consistency ($\alpha = 0.93$)[12] and excellent construct validity.[13,14] The fourth section included items that probed participants' experiences with the TPMP, commonalities with their mentors/mentees, goals, and outcomes. In addition, mentees were asked about the perceived sufficiency of updates on the application process, their relationship with their mentor, as well as the TPMP's impact on their well-being and comfort with applications. Other items in this section were adapted from Maniam et al.[15] Each was rated on a 5-point Likert scale from 1 (I do not identify with this at all) to 5 (I completely identify with this). Mentees were asked about their confidence with medical school applications and with their decision to pursue this career, as well as how likely they would be to recommend the program to other students. Mentors were asked about their comfort providing various types of advice, their relationship with their mentee, the impact of the TPMP on their mental health and residency applications, and how updated they felt by their medical schools about COVID-19–related changes. The fifth section invited participants to share optional, free-text feedback about the TPMP or more information on how they were or were not impacted by the program.

Descriptive analyses were conducted to characterize the groups (premedical student mentees and medical student mentors). Responses to questions about communication, connection, and perceived mental health impact were dichotomized as positive (strongly agree, agree) or not positive (neutral, disagree, strongly disagree). Mentee and mentor responses were then compared by chi-square. Premedical student mentee reports of anxiety and uncertainty before and after participation in the TPMP were likewise dichotomized as positive (I completely identify with this, I mostly identify with this) or not positive (neutral, I mostly do not identify with this, I completely do not identify with this) and then analyzed with chi-square. Regarding the K10, responses were graded on a 5-point Likert scale and totaled, after which respondents were assigned a result based on predetermined cutoffs. Consistent with Dendle et al,[16] scores of 10 to 19 were categorized as likely to be well, 20 to 24 as likely to have a mild mental disorder, 25 to 29 as likely to have a moderate mental disorder, and 30 to 50 as likely to have a severe mental disorder. Descriptive analyses were conducted to characterize the baseline, or preparticipation, self-reported mental health of mentees and mentors based on these scores.

## RESULTS

In total, 888 mentees from 14 universities and colleges participated in the program. Almost half were students at Rice University or Texas A&M University—College Station. Mentees were matched with mentors on a rolling basis according to interest in providing or receiving help in three categories: (1) personal statement and supplementary essay writing, (2) mock interviewing, and (3) general application advice. Approximately 20% of mentees (n = 194) completed the survey. School distributions of respondents were similar to the total population *(Table 1)*. Among survey respondents, most mentees were female and either juniors or seniors in college at the time of enrollment *(Table 2)*. Most (61.9%, n = 120) mentees reported non-Hispanic ethnicity, and over 60% were White or South Asian/Indian American race.

About 64% (n = 124) indicated that they were applying to medical school in the upcoming 2020–2021 application cycle. Although over 80% of mentee survey respondents (n = 162) were involved in an organization at their university that included other students applying to medical school, only about a quarter (23%, n = 45) reported having close family members or family friends with US medical school application experience. Half (50%, n = 97) of mentees reported sufficient updates about medical school application changes by their university. However, less than half (44%, n = 86) felt that they received sufficient updates from application services, including the Texas Medical and Dental Schools Application Service and the American Medical College Application Service.

A total of 595 medical students representing all 10 allopathic Texas medical schools signed up as TPMP mentors. Similar to mentees, 20% (n = 119) responded to the survey. Most mentor survey respondents attended BCM or the University of Texas Medical Branch at Galveston, with distributions of survey respondents among all schools similar to the total population *(Table 1)*. Almost half of mentors were in their third year of medical school. *Table 2* reports the demographics of mentor survey respondents; like mentees, most reported non-Hispanic ethnicity and White race. About 34% (n = 40) were applying to residencies in the upcoming 2020–2021 application cycle. Less than half (45%, n = 54) reported receiving sufficient updates about the application cycle from their medical school, and even less (34%, n = 40) by the Electronic Residency Application Service.

Most (85%, n = 165) mentees were paired with one mentor, but two had two to three mentors. The majority of mentees reported spending one (17%, n = 32), two (21%, n = 41), or three (16%, n = 30) hours in total communicating with their mentors. Although the majority of medical student mentors were paired with one mentee (67%, n = 80), one had 13 mentees. Most mentors reported spending an average of two (17%) to three (17%) hours in total with each mentee. Approximately half of their time was spent communicating through email, with the other half comprising video chat, text, or phone calls.

**Table 1. School distribution of total participants vs survey respondents for premedical student mentees and medical student mentors in the Texas-Wide Premedical Mentoring Program**

| Institution | Total* | Survey* |
|---|---|---|
| Undergraduate university | | |
| Baylor University | 80 (9.0%) | 7 (3.6%) |
| Rice University | 225 (25.3%) | 52 (26.8%) |
| Southern Methodist University | 18 (2.0%) | 6 (3.1% |
| Texas A&M University—College Station | 184 (20.7%) | 42 (21.6%) |
| Texas A&M University—Corpus Christi | 16 (1.8%) | 3 (1.5%) |
| Texas Woman's University | 5 (0.6%) | 2 (1.0%) |
| University of Houston | 35 (3.9%) | 10 (5.2%) |
| University of North Texas | 13 (1.5%) | 0 (0%) |
| UT Arlington | 29 (3.3%) | 6 (3.1%) |
| UT Austin | 79 (8.9%) | 18 (9.3%) |
| UT Dallas | 108 (12.2%) | 27 (13.9%) |
| UT El Paso | 43 (4.8%) | 13 (6.7%) |
| UT Rio Grande Valley | 44 (5.0%) | 5 (2.6%) |
| UT Tyler | 9 (1.0%) | 3 (1.5%) |
| Medical school | | |
| Baylor College of Medicine | 175 (29.4%) | 36 (30.3%) |
| Dell Medical School—UT Austin | 12 (2.0%) | 1 (0.8%) |
| Paul L. Foster School of Medicine—Texas Tech El Paso | 2 (0.3%) | 0 (0%) |
| Texas A&M HSC College of Medicine | 61 (10.3%) | 14 (11.8%) |
| Texas Tech University HSC School of Medicine—Lubbock | 26 (4.4%) | 4 (3.4%) |
| Long School of Medicine—UT Health San Antonio | 24 (0.4%) | 4 (3.4%) |
| McGovern Medicine School—UT HSC at Houston | 96 (16.1%) | 20 (16.8%) |
| UT Medical Branch at Galveston | 129 (21.7%) | 25 (21.0%) |
| UT Rio Grande Valley Medical Center | 19 (3.2%) | 3 (2.5%) |
| UT Southwestern Medical Center | 51 (8.6%) | 12 (10.1%) |

*Undergraduate university: 888 total premedical student mentees matched in this program, with 194 survey respondents. Medical school: 595 total medical student mentors matched in this program, with 119 survey respondents.
HSC indicates health science center; UT, University of Texas.

Most (70%, n = 298) paired mentor-mentee matches went to different undergraduate universities or were different race and/or ethnicities (64%, n = 274). On the other hand, most (56%, n = 240) pairs identified as the same gender. Only about 35% of respondents, however, indicated that having one of these commonalities somewhat enhanced their program experience and pair connection.

**Table 2. Demographics of survey respondents participating in the Texas-Wide Premedical Mentoring Program**

| | Mentees | Mentors |
|---|---|---|
| Survey response | 194 (21.8%) | 119 (20.0%) |
| Gender | | |
| Male | 71 (36.6%) | 38 (31.9%) |
| Female | 121 (62.4%) | 79 (66.7%) |
| Genderqueer | 1 (0.5%) | 1 (0.8%) |
| Prefer not to answer | 1 (0.5%) | 1 (0.8%) |
| Ethnicity | | |
| Hispanic or Latino/a | 37 (19.1%) | 17 (14.4%) |
| Non-Hispanic or Latino/a | 157 (80.1%) | 102 (85.7%) |
| Race | | |
| American Indian or Alaska Native | 0 (0%) | 1 (0.8%) |
| Black or African American | 10 (5.2%) | 5 (4.2%) |
| East Asian | 41 (21.1%) | 22 (18.5%) |
| Middle Eastern or North African | 10 (5.2%) | 3 (2.5%) |
| Native Hawaiian or Pacific Islander | 1 (0.5%) | 1 (0.8%) |
| South Asian or Indian-American | 58 (29.9%) | 17 (14.3%) |
| White | 61 (31.4%) | 62 (52.1%) |
| Prefer not to answer | 5 (2.6%) | 5 (4.2%) |
| Other | 8 (4.1%) | 3 (2.5%) |
| Class | | |
| Freshman / MS1 | 18 (9.3%) | 41 (34.5%) |
| Sophomore / MS2 | 34 (26.8%) | 26 (21.8%) |
| Junior / MS3 | 83 (42.8%) | 37 (31.1%) |
| Senior / MS4 | 38 (19.6%) | 14 (11.8%) |
| Graduated / MD-PhD | 21 (10.8%) | 1 (0.8%) |

MS indicates medical student year.

*Table 3* compares mentee and mentor responses to items regarding communication and connection to their match. Overall, pairs felt similarly connected to each other; however, they did not feel as if a friendship was formed. Both populations believed their counterpart was easy to get in touch with and met each other's expectations. However, mentees felt less "safe" expressing concerns or feedback compared to mentors ($P < 0.01$). Additionally, fewer mentees compared to mentors reported that their counterpart asked directly about mental status ($P = 0.04$). All significant $P$ values, however, had small effect sizes.

*Table 4* outlines the knowledge gap closure for mentees as well as the self-reflection of mentors. The TPMP seemed mainly to improve mentee comfort with the application timeline and medical school interviews. Most mentees also reported believing the TPMP positively impacted their medical school applications. Furthermore, a majority said they were likely to recommend this program to other premedical students. Similarly, a majority of mentors believed they positively impacted their mentees' medical school application and that they provided adequate reassurance amidst the uncertainty, resulting in satisfaction with their own performance.

The baseline mental health status of mentee and mentor survey respondents is reported in the Online Supplement. About 7% of mentees (n = 14) compared to 14% of mentors (n = 17) had previously diagnosed mental health conditions, most commonly anxiety disorders. More mentees (71%, n = 10) than mentors (59%, n = 10) sought treatment. According to the K10, about half of mentees (47%, n = 91) were well (without mental distress), compared to more than half (62%, n = 73) of mentors. About a quarter of both mentees and mentors indicated mild mental distress.

*Table 4* also reports respondents' views on the program's impact on their mental health. Regarding the uncertainty of application changes, the majority of mentees felt less alone or more supported, less anxious, and less distressed. Most mentees and mentors believed the TPMP positively impacted their mental health, with no statistically significant difference between groups ($\chi^2$ [1, $N = 289$] = 0.86, $r_\phi$ = 0.5,

**Table 3. Survey responses related to communication and connection between premedical student mentees and medical student mentors participating in the Texas-Wide Premedical Mentoring Program**

| | Mentees | | Mentors | | | | |
|---|---|---|---|---|---|---|---|
| Survey prompt | Response (N) | n (%) | Response (N) | n (%) | *P* value | $\chi^2$ | $r_\phi$ |
| I feel I connected well with my mentor/mentee. | 182 | 120 (65.9%) | 114 | 76 (66.7%) | 0.90 | 0.82 | 0.05 |
| We developed a personal friendship. | 181 | 41 (22.7%) | 113 | 34 (30.1%) | 0.16 | 1.95 | 0.08 |
| My mentor/mentee is easy to get in touch with. | 180 | 150 (83.3%) | 113 | 94 (83.2%) | 0.94 | 0.005 | 0.004 |
| I feel safe expressing concerns/feedback. | 179 | 135 (75.4%) | 112 | 103 (92.0%) | **0.0004** | 12.66 | 0.21 |
| My mentor/mentee checks in on my mental status. | 174 | 38 (21.8%) | 99 | 32 (32.3%) | **0.04** | 4.06 | 0.12 |
| My mentor/mentee met my expectations | 178 | 141 (79.2%) | 112 | 90 (80.4%) | 0.81 | 0.06 | 0.01 |

**Table 4. Survey responses related to knowledge gaps, self-reflection, and mental health of premedical student mentees and medical student mentors in the Texas-Wide Premedical Mentoring Program**

| Survey prompt | Response (N) | n (%) |
|---|---|---|
| *Knowledge gaps* | **Mentees** | |
| This program has made me feel more comfortable with my knowledge and preparation for medical school interviews. | 178 | 116 (65.2%) |
| This program has made me feel more comfortable with my knowledge about the medical school application timeline. | 175 | 127 (72.6%) |
| This program has made me feel more comfortable with my knowledge about who to ask for letters of recommendation. | 158 | 72 (45.6%) |
| This program has made me more confident in how to use my free time productively to better myself as an applicant. | 164 | 89 (54.3%) |
| I believe the TPMP has positively impacted my medical school applications. | 175 | 138 (78.9%) |
| *Mental health* | | |
| This program has made me feel less anxious regarding the uncertainty of medical school applications given the COVID-19 pandemic. | 175 | 95 (54.3%) |
| This program has made me feel less down regarding the uncertainty of medical school applications given the COVID-19 pandemic. | 173 | 91 (52.6%) |
| This program has made me feel less alone and more supported regarding navigating the medical school application process in the COVID-19 pandemic. | 176 | 120 (68.2%) |
| I believe the TPMP has positively impacted my mental health. | 177 | 117 (66.1%) |
| *Self-reflection* | **Mentors** | |
| I have positively impacted my mentee's medical school application. | 110 | 84 (76.4%) |
| I have provided my mentee application reassurance given all the uncertainty. | 108 | 86 (79.6%) |
| I have received direct confirmation of my mentee's appreciation. | 111 | 90 (81.1%) |
| I am satisfied with my performance as a mentor. | 112 | 85 (75.9%) |
| *Mental health* | | |
| This program has made me feel more fulfilled during this pandemic. | 115 | 90 (78.3%) |
| I believe the TPMP has positively impacted my mental health. | 112 | 68 (60.7%) |
| I believe the TPMP will positively impact my residency applications. | 101 | 61 (60.4%) |

TPMP indicates Texas-Wide Premedical Mentoring Program.

$P = 0.35$). Furthermore, most mentors reported that the TPMP increased fulfillment during the suspension from usual medical student activities.

All areas of tested mentee psychological well-being improved from before to after participation in the TPMP *(Table 5)*. These areas included anxiety or nervousness ($P < 0.01$), doubt or insecurity ($P < 0.01$), uncertainty or disinterest ($P = 0.03$), feeling unconnected or distant ($P = 0.01$), and having a poor outlook ($P < 0.01$). These comparisons also had small effect sizes.

## DISCUSSION

This study reports on the effectiveness of the TPMP to support premedical and medical students during the COVID-19 pandemic, regarding primarily medical school applications and secondarily mental health. Their synergistic relationship and common struggle allowed for the TPMP to result in mutual benefit.

The method of matching mentor-mentee pairs was mostly successful, as about 80% of participants felt that their counterpart met expectations. Most pairs felt connected to each other and safe expressing concerns or providing constructive feedback. However, only about 20% to 30% felt as if they developed a personal friendship or checked up on each other's mental health. This could be because no communication guidance was provided. Without explicit program encouragement, asking about mental health can be viewed as personal. Only about 35% believed that being paired with someone from the same undergraduate university, race, or identified gender would enhance their connection.

The spectrum of relationship strengths could also be explained by the range of time that pairs spent interacting, where some mentor-mentees only interacted for a few hours.

**Table 5. Survey responses related to the Texas-Wide Premedical Mentoring Program's impact on premedical student mentee attitudes both before and after the mentorship program**

| Survey prompt | Before | | After | | *P* value | $\chi^2$ | $r_\phi$ |
|---|---|---|---|---|---|---|---|
| | Response (N) | n (%) | Response (N) | n (%) | | | |
| I was nervous or anxious about applying to medical school in the future (anxiety or nervousness). | 186 | 142 (76.3%) | 182 | 99 (54.4%) | **<0.00001** | 19.60 | 0.23 |
| I was unsure if I would even be accepted to medical school despite all of my work (doubt or insecurity). | 184 | 127 (69.0%) | 182 | 76 (41.8%) | **<0.00001** | 27.53 | 0.27 |
| I was not sure if medicine was the field for me (uncertainty or disinterest). | 185 | 18 (9.7%) | 182 | 7 (3.8%) | **0.03** | 5.00 | 0.12 |
| Relative to my peers, I did not feel that I had much of a connection to the field of medicine despite my interest (unconnected or distant). | 184 | 34 (18.5%) | 182 | 17 (9.3%) | **0.01** | 6.37 | 0.13 |
| The route to medical school seemed long and difficult and, at times, impossible (poor outlook). | 184 | 81 (44.0%) | 183 | 48 (26.2%) | **0.0004** | 12.74 | 0.12 |

Bold indicates statistically significant at $P < .05$.

In a different program, medical students were matched with faculty members and met on average three times every year. Mentees rated their mentor satisfaction as a 5.1 out of 7.[17] The TPMP potentially could have benefited from encouraging members to meet at least three times during a set interval; however, it was interesting that more mentors felt safe providing feedback than mentees felt expressing concerns.

The TPMP was created not only to supplement constrained resources but also help with virtual interviews and essays. Mock interviews were held through video chat, which this program initiated prior to the American Academy of Medical College recommendation to host virtual interviews. Therefore, premedical students who had already been preparing with their mentors could potentially feel more comfortable in this novel online format, reflected by 65.2% expressing improved interview comfortability. Overall, 79% of mentees believed this program positively improved their applications, and 87% would likely recommend it to others.

These findings build on a robust mentorship literature[5,15,18–22] and demonstrate the positive impact a program may have on both mentors and mentees. Outside of universal health crises, mentoring programs are important in medical student training. Professionals, including those in the medical field, who experience strong personal and educational mentorship report greater career satisfaction and productivity.[19,20,23–25] There is a mutual synergistic benefit in the mentor-mentee relationship throughout all career stages, increasing the likelihood of success, fostering growth, and increasing a sense of personal accomplishment.[21] Additionally, students readily adapt to and benefit from virtual mentorship.[22]

Especially during times of constant change and uncertainty, there is a need for premedical organizations or programs at undergraduate institutions to seek partnerships with medical schools. The TPMP demonstrated the wide variety of academic and social support that different undergraduate institutions may provide. While some mentees utilized the TPMP to supplement support that they were already receiving, others had little to no aid from their undergraduate schools. The core services provided have been turned into a business, with consultants charging hefty fees. Yet, some students cannot afford these services, especially in a professional path that can accrue high student loans from tuition alone. Mentoring programs like the TPMP, but at an institutional level, could be created with partnerships from medical schools.

The TPMP significantly impacted psychological well-being as evidenced by decreases in anxiety, insecurity, uncertainty, and a feeling of disconnection from medicine. The program's greatest effects seemed to be easing nervousness and anxiety about applications as well as uncertainty regarding medical school acceptances. The question prompts regarding psychological well-being were modeled after a similar mentoring program, created by medical students from Texas Tech University Health Sciences Center (TTUSC) School of Medicine to mentor premedical students at Texas Tech University.[15] Their results only demonstrated significant improvement in anxiety, nervousness, doubt, and insecurity.[15] However, the TPMP involved many more participants (888 vs 216 premedical students) and included more universities and medical schools. Furthermore, the TPMP had no participation requirements and emerged during a pandemic. Lastly, the TPMP retrospectively asked before-and-after questions, while the TTUSC program had a presurvey and postsurvey. All these factors may have contributed to differences in findings.

Regarding mental health, the TPMP seemed to have impacted mental health during the pandemic across all areas. The biggest impact was feeling less alone and more supported throughout this process. Baseline mental health survey results (K10) revealed higher levels of mental health–related symptoms compared to formally diagnosed mental health problems, possibly due to stigma, social

desirability bias, or reluctance to seek help among the medical community.[12] Compared with 61% of mentors, 66% of mentees felt that the program positively impacted their mental health. However, the difference between groups was not statistically significant, indicating that the positive mental health impact on mentors was comparable to that of mentees. A large percentage (78%) of medical students reported feeling more fulfilled. This is reflective of most medical students' desire to be part of the health care team.

This study was subject to several limitations. Only about 20% of mentors and mentees participated in the survey, so there might have been selection bias in responses. Consequently, the survey did not have sufficient power to establish conclusive statements or define potentially critical response variabilities between cultural groups. Given that this program did not initially begin as a research project, the survey was retrospective, and the method of recruitment was not completely standardized across all institutions. In addition, there was potentially more recruitment bias for mentors from BCM as the program originated from this medical school and mentees from Rice University given its location within the Texas Medical Center. In addition, while the K10 was used to assess distress in lieu of the Patient Health Questionnaire-9 to decrease the length of the survey, the latter could have been utilized to better gauge the presence of depressive symptoms.[26] Finally, there was no follow-up of mentee outcomes.

In conclusion, the TPMP is the largest reported premedical-to-medical student mentorship program and is unique to a national pandemic. For mentees, the program not only decreased knowledge gaps about application specifics, but also eased anxiety about unknowns and provided support throughout this process. The program had a similar influence on the mental health of mentees and mentors and added to mentor fulfillment during their time of suspension. This study revealed the benefit of medical school to undergraduate university partnerships, and we plan to maintain this program to provide continual premedical student support.

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## ORCID

Christi J. Guerrini http://orcid.org/0000-0003-4430-2740
Eric A. Storch http://orcid.org/0000-0002-7631-3703

1. AAMC. Your journey from premed through residency. Accessed September 14, 2020. https://students-residents.aamc.org/.
2. Sahu P. Closure of universities due to coronavirus disease 2019 (COVID-19): impact on education and mental health of students and academic staff. *Cureus*. 2020;12(4):e7541. doi:10.7759/cureus.7541.
3. Chang J, Yuan Y, Wang D. Mental health status and its influencing factors among college students during the epidemic of COVID-19. *Nan Fang Yi Ke Da Xue Xue Bao*. 2020;40(2):171–176. doi:10.12122/j.issn.1673-4254.2020.02.06.
4. Cao W, Fang Z, Hou G, et al. The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Res*. 2020;287:112934. doi:10.1016/j.psychres.2020.112934.
5. Rastegar Kazerooni A, Amini M, Tabari P, Moosavi M. Peer mentoring for medical students during the COVID-19 pandemic via a social media platform. *Med Educ*. 2020;54(8):762–763. doi:10.1111/medu.14206.
6. Menon A, Klein EJ, Kollars K, Kleinhenz ALW. Medical students are not essential workers: examining institutional responsibility during the COVID-19 pandemic. *Acad Med*. 2020;95(8):1149–1151. doi:10.1097/ACM.0000000000003478.
7. Kent GG, Kunkler AJ. Medical student involvement in a major disaster. *Med Educ*. 1992;26(2):87–91. doi:10.1111/j.1365-2923.1992.tb00131.x.
8. Myhre D, Bajaj S, Fehr L, Kapusta M, Woodley K, Nagji A. Precepting at the time of a natural disaster. *Clin Teach*. 2017;14(2):104–107. doi:10.1111/tct.12523.
9. Carter FA, Bell CJ, Ali AN, McKenzie J, Wilkinson TJ. The impact of major earthquakes on the psychological functioning of medical students: a Christchurch, New Zealand study. *N Z Med J*. 2014;127(1398):54–66.
10. Wilkinson TJ, Ali AN, Bell CJ, Carter FA, Frampton CM, McKenzie JM. The impact of learning environment disruption on medical student performance. *Med Educ*. 2013;47(2):210–213. doi:10.1111/medu.12065.
11. Goldenberg MN, Hersh DC, Wilkins KM, Schwartz ML. Suspending medical student clerkships due to COVID-19. *Med Sci Educ*. 2020;30(3):1–4. doi:10.1007/s40670-020-00994-1.
12. Kessler RC, Andrews G, Colpe LJ, et al. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med*. 2002;32(6):959–976. doi:10.1017/s0033291702006074.
13. Fassaert T, De Wit MAS, Tuinebreijer WC, et al. Psychometric properties of an interviewer-administered version of the Kessler Psychological Distress scale (K10) among Dutch, Moroccan and Turkish respondents. *Int J Methods Psychiatr Res*. 2009;18(3):159–168. doi:10.1002/mpr.288.
14. Arnaud B, Malet L, Teissedre F, et al. Validity study of Kessler's psychological distress scales conducted among patients admitted to French emergency department for alcohol consumption-related disorders. *Alcohol Clin Exp Res*. 2010;34(7):1235–1245. doi:10.1111/j.1530-0277.2010.01201.x.
15. Maniam G, Dean R, Urban R, Williams S. Implementation of a pilot medical student mentoring program for premedical students and its effects on premedical student attitudes. *Proc (Bayl Univ Med Cent)*. 2020;33(3):346–349. doi:10.1080/08998280.2020.1743603.
16. Dendle C, Baulch J, Pellicano R, et al. Medical student psychological distress and academic performance. *Med Teach*. 2018;40(12):1257–1263. doi:10.1080/0142159X.2018.1427222.
17. Abernethy AD. A mentoring program for underrepresented-minority students at the University of Rochester School of Medicine. *Acad Med*. 1999;74(4):356–359. doi:10.1097/00001888-199904000-00023.
18. Haglund MEM, Aan Het Rot M, Cooper NS, et al. Resilience in the third year of medical school: a prospective study of the associations between stressful events occurring during clinical rotations and student well-being. *Acad Med*. 2009;84(2):258–268. doi:10.1097/ACM.0b013e31819381b1.
19. Clutterbuck D. *Everyone Needs a Mentor: Fostering Talent in Your Organisation*. London, UK: CIPD Publishing; 2004.
20. Wright D, Hedges J. Mentoring faculty members to the next level. Presented at: Society for Academic Emergency Medicine, Des Plaines, IL, 2009.

21. Garmel GM. Mentoring medical students in academic emergency medicine. *Acad Emerg Med*. 2004;11(12):1351–1357. doi:10.1197/j.aem.2004.06.013.
22. Hodgson JC, Hagan P. Medical education adaptations during a pandemic: transitioning to virtual student support. *Med Educ*. 2020; 54(7):662–663. doi:10.1111/medu.14177.
23. Halpern J. The U.S. National Academy of Sciences—in service to science and society. *Proc Natl Acad Sci USA*. 1997;94(5):1606–1608. doi:10.1073/pnas.94.5.1606.
24. Paice E, Heard S, Moss F. How important are role models in making good doctors? *BMJ*. 2002;325(7366):707–710. doi:10.1136/bmj.325.7366.707.
25. Burgess A, van Diggele C, Mellis C. Mentorship in the health professions: a review. *Clin Teach*. 2018;15(3):197–202. doi:10.1111/tct.12756.
26. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med*. 2001;16(9):606–613. doi:10.1046/j.1525-1497.2001.016009606.x.

# Avocations

"Winter at Lakeside Park," Highland Park, Dallas County, Texas. Photo copyright © Rolando M. Solis, MD. Dr. Solis is co-medical director of the Cardiopulmonary Rehabilitation Program at Baylor Scott & White The Heart Hospital – Plano. Prior to his current position, he practiced interventional cardiology at Baylor University Medical Center in Dallas, Baylor Medical Center at Garland, and Baylor Scott & White The Heart Hospital – Plano for over 4 decades.